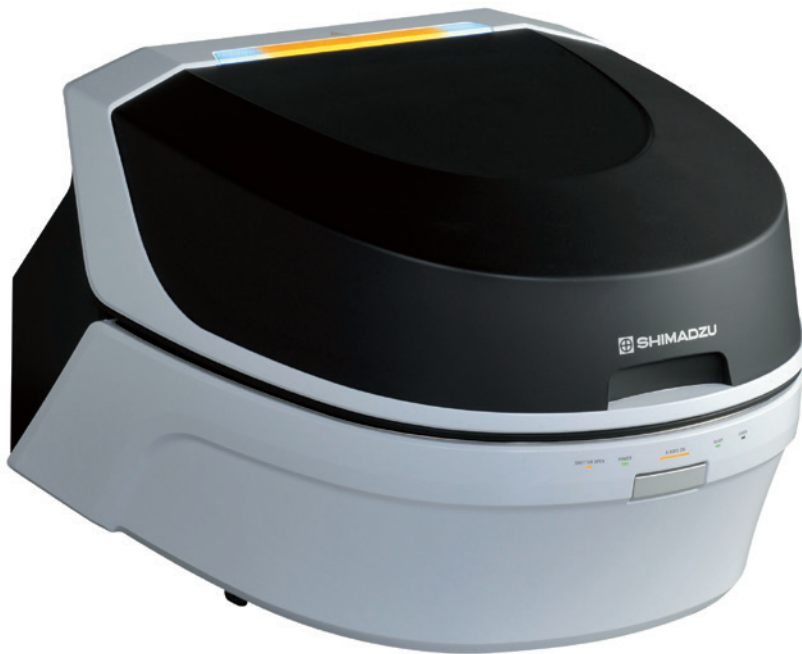


Energy-Dispersive X-Ray Fluorescence Spectrometer

EDX-7000/8000 Series

Supplies and Maintenance Parts



Contents

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Major Components



These parts must be replaced by a service engineer. Please contact your local Shimadzu office for more information.

PN	Part Name	Replacement Guideline*
212-24378-91	X-ray Tube, XTF-5011A	3 years
212-25358-41	Power Supply, 50 kV Inverter	5 years
212-25470-41	Detector (SDD), EDX-7000	5 years
212-25470-42	Detector (SDD), EDX-8000	5 years



*Estimate based on usage of 8 hours a day, 5 days a week.

User Maintenance

Main Body

Category	Product Name	Remarks	P/N	External Appearance
Sample Chamber	O-ring, AS568A-280 1A	For sample chamber	036-15502-80	
Power Supply	Fuse, 218 3.15P (250 V, 3.15 A)	For main body *2 REQ'D	072-02004-21	

Vacuum Unit

Category	Product Name	Remarks	P/N	External Appearance
Vacuum Pump	Ultragrade® 19 Pump Oil	1 L supply	220-97808-00	
Power Supply	Fuse, 216 010.P (250 V, 10 A)	For switching box *2 REQ'D	072-02004-73	

Miscellaneous

Product Name	Remarks	P/N
X-ray Key	2 included *Special order	064-90057-02

Accessories

Standards

Product Name	P/N
Instrument Calibration Standard (EDX-7000)	212-24507-96
Instrument Calibration Standard + Check Sample (EDX-8000)	212-24507-91
RoHS Check Sample	212-24705-92
RoHS and Halogen Check Sample	212-24705-91
RoHS, Halogen, and Sb Check Sample	212-24705-93





RoHS Screening Kits

*Includes software, manuals, and check samples

Product Name	P/N
RoHS Screening Analysis Kit	212-25475-41
RoHS and Halogen Screening Analysis Kit	212-25476-41
RoHS, Halogen, and Sb Screening Analysis Kit	212-25477-41

Sample Cells and Film

*For help choosing accessories, see the Selection Guide

Product Name	Remarks	PN	External Appearance
Double Open-Ended X-Cell	100/pk	219-85000-55	
Closed X-Cell	100/pk	219-85000-52	
Micro X-Cell	100/pk	219-85000-54	
Universal Closed X-Cell	100/pk	219-85000-53	





Mylar® Window Film	500 pre-cut circles	202-86501-56
Polypropylene Window Film	300' roll	219-82019-05
Ultralene® Window Film	500 pre-cut circles	220-95352-01
Kapton® Window Film	500 pre-cut circles	220-95352-02




Filter Paper

Product Name	Remarks	PN
Filter Paper	Allows vacuum option for liquids (50/pk)	210-16043-50
Ion Exchange Paper - Cation	1 piece	210-16167-01
Ion Exchange Paper - Anion	1 piece	210-16167-03
Ion Exchange Paper - Chelate	1 piece	210-16167-02
Drying Rack	Holds 20 samples	205-07221-00

Sample Presses and Accessories

*For help choosing accessories, see the [Selection Guide](#)



Product Name	PN	Remarks	External Appearance
Manual Press	220-95372-02	Full-size 25-ton (22.7 metric ton) Carver® hydraulic laboratory pellet press that accepts 13 mm, 31 mm, 35 mm, and 40 mm pellet die sets. Manually controlled.	
X-Press	220-95372-01	35-ton (31.8 metric ton) hydraulic laboratory pellet press that accepts 13 mm, 31 mm, 35 mm, and 40 mm pellet die sets. Automatic and fully programmable.	
Evacuatable Pellet Die Set (31 mm)	220-95372-40	Used to form 31 mm standard sample disks for XRF. Set includes evacuatable die body, base, plunger, two 31 mm polished steel pellets, O-ring vacuum seals, and knock-out ring for sample disk extraction.	
Evacuatable Pellet Die Set (40 mm)	220-95372-41	Used to form 40 mm sample disks. Set includes evacuatable die body, base, plunger, two 40 mm polished steel pellets, O-ring vacuum seals and knock-out ring for sample disk extraction.	

Pre-flared Spec-Caps® (31 mm)	220-95372-30	Pre-flared, shallow, thin-walled aluminum cap for reinforcing XRF pellets. 31 mm wide x 8 mm deep. Produces pellets 31 mm x 5 mm (100/pk)	
Spec-Caps® (38 mm)	220-95372-31	Shallow, thin-walled aluminum cap for reinforcing XRF pellets. 38 mm wide x 9 mm deep. Produces pellets 40 mm x 5 mm (100/pk)	
Edge-flaring Tool (40 mm)	220-95372-32	Tool for flaring the edge of Spec-Caps® to create a tighter fit in the pellet die	

Cellulose Binder	150 g bottle	220-95372-50
UltraBind®	150 g bottle	220-95372-51
Paraffin Binder	150 g bottle	220-95372-52

Sample Mills and Accessories

*For help choosing accessories, see the Selection Guide

Product Name	PN	Remarks	External Appearance
Mixer/Mill	220-95372-10	High-energy ball mill that accommodates sample sizes ranging from 0.2 - 10 grams	
Freezer/Mill	220-95372-03	Cryogenic mill that accommodates sample sizes ranging from 0.1 - 5 gram	

Tungsten Carbide Grinding Set	Includes body, caps, balls, and gaskets	220-95372-20
Alumina Ceramic Grinding Set	Includes body, caps, balls, and gaskets	220-95372-21
Methacrylate Grinding Set	Includes body, caps, balls, and gaskets	220-95372-22
Hardened Steel Grinding Set	Includes body, caps, balls, and gaskets	220-95372-23

Sample Prep Selection Guide

There are several factors to take into account when selecting the correct prep accessories for your samples. These can include, but are not limited to:

- Sample volume
- Sample density
- X-ray transmission
- Sample form
- Sample viscosity
- Sensitivity requirements
- Sample matrix
- Sample volatility
- Analysis atmosphere
- Sample reactivity / stability
- Sample pH
- Elements of interest

Sample Cells



219-85000-55
3571
Double Open-Ended X-Cell

Disposable open-ended X-ray cell with collar. Includes two polyethylene snap-rings, collar, and open body.

- Ideal for unusual or hard-to-handle samples such as slurries, sludge, pastes, and viscous materials like glue tar and RTV sealant
- Squared snap-ring design insures proper positioning in sample holders
- Collar holds ring in place while film is being applied
- Can be run with open back or sealed window back
- Made of contaminate-free polyethylene

Overall Height: .866 in **Aperture:** 24.5 mm
Window Plane OD: 1.244 in **Capacity:** 10 mL
Material: Polyethylene **Overall OD:** 1.244 in



219-85000-54
3577
Micro X-Cell

Disposable micro X-ray cell with collar for running of small, air-sensitive or hazardous samples in XRF spectrometers. Includes two polyethylene snap-rings, collar, and open body.

- 6.3 mm window is centered in standard 31 mm sample holder.
- Only requires 0.5 mL of sample.
- Can be run with open back or sealed window back
- For hazardous or sensitive samples, top can be fitted with a standard 7 x 13 mm serum bottle closure for injection, purging, or sample isolation.
- Made of contaminate-free polyethylene.

Overall Height: .866 in **Aperture:** 6.3 mm
Window Plane OD: 1.244 in **Capacity:** 0.5 mL
Material: Polyethylene **Overall OD:** 1.244 in



219-85000-52
3529
Closed X-Cell

Disposable closed X-ray cell. Includes a polyethylene snap-ring and cup with snap-post vent and reservoir.

- Reservoir cup catches any liquids that expand through the vent, guarding against spillage in inverted-optic spectrometers
- Roughened surface within the reservoir cup facilitates labeling
- Made of contaminate-free polyethylene.

Overall Height: .866 in **Aperture:** 24.5 mm
Window Plane OD: 1.201 in **Capacity:** 8 mL
Material: Polyethylene **Overall OD:** 1.260 in



219-85000-53
3561
Universal Closed X-Cell

Disposable closed X-ray cell with collar. Includes a polyethylene snap-ring and cup with snap-post vent and reservoir.

- Patented snap-open seal for venting volatile samples ensures a smooth flat window for improved precision.
- Reservoir cup catches any liquids that expand through the vent, guarding against spillage
- Roughened surface within the reservoir cup facilitates labeling.
- Made of contaminate-free polyethylene.

Overall Height: .866 in **Aperture:** 24.5 mm
Window Plane OD: 1.244 in **Capacity:** 8 mL
Material: Polyethylene **Overall OD:** 1.244 in

Sample Prep Selection Guide

All films are pre-cut circles designed to fit standard sample cells

Sample Film	
<p>202-86501-56</p> <p>Mylar® Window Film</p> <ul style="list-style-type: none"> Unusually strong for its thickness Resistant to organic chemicals but vulnerable to strong acids and strong bases Heat resistant up to 100°C May contain trace levels (ppm) of Ca, P, Fe, Cu, Zn, or Sb <p>Thickness: 0.25 mil (6.35 µm)</p>	<p>220-95352-01</p> <p>Ultralene® Window Film</p> <ul style="list-style-type: none"> Considered to offer the best balance between X-ray transmission, chemical resistivity, strength, and purity Reasonably resistant to acids, bases, and many organic chemicals, but can be attacked by aromatic and halogenated hydrocarbons Heat resistant up to 100°C. <p>Thickness: 0.16 mil (4.06 µm)</p>
<p>219-82019-05</p> <p>Polypropylene Window Film</p> <ul style="list-style-type: none"> Reasonably resistant to acids, bases, and many organic chemicals, but can be attacked by aromatic and halogenated hydrocarbons Heat resistant up to 100°C May contain trace levels (ppm) of Ca, Zr, P, Fe, Zn, Cu, Ti, and Al <p>Thickness: 0.2 mil (5.08 µm)</p>	<p>220-95352-02</p> <p>Kapton® Window Film</p> <ul style="list-style-type: none"> Often considered the closest thing to a “bombproof” XRF window film Incredibly strong and heat resistant to over 300°C Chemically impervious to almost anything except strong alkali solutions Phosphate-based surface coating improves its handling characteristics <p>Thickness: 0.3 mil (7.62 µm)</p>

Sample Prep Selection Guide

Sample Presses



220-95372-02

3622

Carver® Manual Press

- Manual, hydraulic laboratory press with buffer plate.
- Can be operated anywhere in the world, even under the most primitive conditions
- Economical alternative to motorized presses for labs with a small sample load
- Hardened steel buffer plate is engraved with concentric circles and enables easy centering of the die
- Upper platen is equipped with a safety shield for operator protection.

Force:	0-25 tons	Daylight:	Adj. 0-9 in
Platen Movement:	6.5 in	Dimensions:	42 x 19 x 24 in
Platen Size:	9 x 9 in	Net Weight:	350 lbs



220-95372-01

3636

X-Press®

- Automated, programmable laboratory press
- Presses samples in minutes
- Safety interlock and automatic pump shut-off safety valve
- Can be operated manually as a simple motorized press whose functions are under direct user control
- Programmable LCD touch screen interface. Allows the user to enter final pressure desired, time to hold at the final pressure, and interval to return back to zero pressure

Force:	10-35 tons	Daylight:	Adj. 2-6 in
Platen Movement:	1 in	Dimensions:	20 x 39 x 22.5 in
Platen Size:	ø 3.25 in	Net Weight:	145 lbs
Screw Adj.:	3.5 in	Dwell Time:	0-10 min
		Release Time:	0-10 min

Die Sets



220-95372-40

3623

31 mm Evacuatable Pellet Die Set

- Vacuum hose attachment enables a vacuum pump to be hooked up to the die before and during pressing to withdrawal air and moisture from the sample.
- Load limit: 50 tons
- Use with Pre-flared 31 mm Spec-Caps® (220-95372-30) to reinforce pressed pellets and protect the die bore
- Includes:
 - Evacuatable die body
 - Base
 - Plunger
 - Two 31 mm polished steel pellets
 - O-ring vacuum seals
 - Knock-out ring for disk extraction



220-95372-41




3614

40 mm Evacuatable Pellet Die Set

- Vacuum hose attachment enables a vacuum pump to be hooked up to the die before and during pressing to withdrawal air and moisture from the sample.
- Load limit: 50 tons
- Use with 38 mm Spec-Caps® (220-95372-31) to reinforce pressed pellets and protect the die bore
- Includes:
 - Evacuatable die body
 - Base
 - Plunger
 - Two 40 mm polished steel pellets
 - O-ring vacuum seals
 - Knock-out ring for disk extraction

Sample Prep Selection Guide

Sample Pellet Caps

 <p style="margin: 0;">220-95372-30</p> <p style="margin: 0;">3619A</p> <p style="margin: 0;">31 mm Pre-Flared Spec-Caps®</p> <p style="margin: 10px 0 0 0;">Pre-flared, shallow, thin-walled aluminum cap for reinforcing XRF pellets. Forms the bottom and sides of the finished pellet. Pre-flared for a snug fit in the 3623 31 mm Evacuatable Pellet Die, and has an unpainted surface.</p> <ul style="list-style-type: none"> •Ensures a snug fit against the walls of the pellet die •Prevents sample loss and pellet jamming •Reinforces sample disks to resist chipping and breaking •Makes sample disks easier to remove from the pellet die •Minimizes contamination during sample handling •Protects the bore of the pellet die from abrasive samples <p style="margin: 10px 0 0 0;">Diameter: 31 mm Depth: 8 mm Pellet Size: 31 mm x 5 mm</p>	 <p style="margin: 0;">220-95372-31</p> <p style="margin: 0;">3617</p> <p style="margin: 0;">38 mm Spec-Caps®</p> <p style="margin: 10px 0 0 0;">Pre-flared, shallow, thin-walled aluminum cap for reinforcing XRF pellets.</p> <ul style="list-style-type: none"> •Makes sample disks easier to remove from the pellet die. •Minimizes contamination during sample handling. •Protects the bore of the pellet die from abrasive samples. •Painted outer surface prevents seizure in the die and facilitates labeling. <p style="margin: 10px 0 0 0;">Diameter: 38 mm Depth: 9 mm Pellet Size: 40 mm x 5 mm</p>
 <p style="margin: 0;">220-95372-32</p> <p style="margin: 0;">3618</p> <p style="margin: 0;">Edge-Flaring Tool (30 mm and 40 mm)</p> <p style="margin: 10px 0 0 0;">Tool for flaring the edge of Spec-Caps® to create a tighter fit in the pellet die. To use, simply press the tapered end of the Edge-Flaring Tool into the Spec-Cap®.</p> <ul style="list-style-type: none"> •Edge-flaring prevents sample loss and pellet jamming. •Increases the Spec-Cap® rim diameter to 31 mm or 40 mm. •Compatible with 38 mm Spec-Caps® and 30 mm Spec-Caps® 	

Sample Prep Selection Guide

Sample Binders	
<p>220-95372-50</p> <p>3642 Cellulose Binder</p> <p>≤ 20 μm powder, 150g bottle. Ideal for samples which crumble or ablate after pressing. Can be blended with sample at 10% by weight to form XRF sample disk, or used undiluted as sample matrix with Sleeve-and-Plunger Set.</p> <ul style="list-style-type: none"> •Ideal for samples which crumble or ablate after pressing •Blends quickly and completely with samples at 10-25% by weight to form XRF sample disks •Can be used undiluted as a sample matrix with the sleeve-and-plunger technique •Will not stick to the pellet die nor contaminate the sample •Does not cake in the bottle during storage •Bonds 200-250 sample disks or provides matrix for 25-35 supported sample disks <p>Particle Size: ≤ 20 μm</p>	<p>220-95372-51</p> <p>3644 UltraBind®</p> <p>Specially formulated UltraBind® powder with a particle size of less than 20 μm. Combines the moisture resistance of Paraffin Binder along with the ease of removing a prepared disk from the die set associated with the Cellulose Binder. UltraBind® may include low levels of NaCl.</p> <ul style="list-style-type: none"> •Ideal for samples which crumble or ablate after pressing •Blends quickly and completely with samples at 10-25% by weight to form XRF sample disks •Can be used undiluted as a sample matrix with the sleeve-and-plunger technique •Self lubricating and will not stick to the pellet die •Moisture resistant and resists cracking and swelling in storage •Bonds 200-250 sample disks or provides matrix for 25-35 supported sample disks <p>Particle Size: < 20 μm</p>
<p>220-95372-52</p> <p>3646 Paraffin Binder</p> <p>Paraffin powder with a particle size of less than 30 μm.</p> <ul style="list-style-type: none"> •Ideal for samples which crumble or ablate after pressing •Blends quickly and completely with samples at 10-20% by weight to form XRF sample disks •Forms air-stable sample disks as the waxy binder seals the surface against moisture •Moisture resistant and does not contaminate samples •Bonds 200-250 sample disks <p>Particle Size: ≤ 30 μm</p>	

Sample Prep Selection Guide

Sample Ball Mills



220-95372-10

**8000M
Mixer/Mill®**

High-energy ball mill that accommodates sample sizes ranging from 0.2 - 10 grams. Ideal for grinding dry, brittle samples.

Applications include: Mechanical alloying, slurry grinding, blending powders and mixing emulsions

Typical samples include: Rocks, Minerals, Sand, Cement, Slag, Ceramics, Catalyst Supports, Glass, Pharmaceuticals, Plant and Animal Tissues, Cannabis, Seeds, Paints and Ink

Power: 115 V / 60 Hz or 230 V / 50 Hz
Dimensions: 19 in x 14 in x 18 in
Motor: 1/3 hp; 1725 RPM @ 60 Hz or 1425 RPM @ 50 Hz
Movement: 2-1/3 in back-and-forth; 1 in side-to-side
Speed: 1060 cycles/min (115 V) or 875 cycles/min (230 V)
Timer: 100 min range (expandable to 1,000 or 10,000 min)



220-95372-03

**6770
Freezer/Mill®**

Small cryogenic mill that accommodates sample sizes ranging from 0.1 - 5 grams. It is specifically designed for cryogenic grinding and pulverizing of tough and/or temperature sensitive samples immersed in liquid nitrogen.

Applications include: DNA/RNA extraction, THC extraction, protein extraction, forensic testing, materials testing, pharmaceutical analysis, drug testing, RoHS/WEEE and volatiles extraction

Typical samples include: Animal tissue, plastic and polymers, yeast, pharmaceuticals, food products, electronic components, textiles, hair, teeth, bones, plant tissue such as cannabis, seeds, leaves and roots

- Grinding chamber holds one microvial set and one small grinding vial
- Equipped with liquid nitrogen sensor, insulated case and lid safety interlock switch for operator protection
- Liquid nitrogen required for operation
- Magnetically driven sample impactor is the only moving part so there are no mechanical linkages or bearings to fail
- Pre-cooling chamber holds up to three additional grinding vials for high-throughput sample processing
- Programmable parameters include grinding time, impactor rate, pre-cooling and cooling times
- Touch screen stores up to 10 user-defined grinding programs for easy quick recall
- Closed grinding vials eliminate sample cross-contamination, retain volatiles, control hazardous or critical samples, and simplify clean-up

Power: 115 V / 60 Hz or 230 V / 50 Hz
Dimensions: 19 in x 10.5 in x 12.75 in

Sample Prep Selection Guide

Sample Grinding Sets



220-95372-20

**8004
Tungsten Carbide Grinding Vial Set**

55 mL tungsten carbide grinding vial set. Vial is 2 ¼ in diameter x 2 ½ in long. Set includes tungsten carbide-lined body, two screw-on tungsten carbide-lined caps, two 7/16 in tungsten carbide balls, and eight corprene gaskets.

- Ideal for grinding hard, brittle samples to an analytical fineness
- Also useful for blending powders and mixing emulsions
- High resistance to abrasion
- Long-wearing and very high efficiency
- Substantially harder and heavier than steel so it grinds faster and with less contamination
- Suitable for slurry grinding

Sample Capacity – Grinding: 3 - 10 g
Sample Capacity – Mixing: 25 mL
Typical Sample Size: 10 g
Hardness: Mohs 8-1/2+; Knoop 1400-1800
Major Elements: W, C, Co
Minor Elements: Ta, Ti, Nb



220-95372-21

**8003
Alumina Ceramic Grinding Vial Set**

45 mL alumina ceramic grinding vial set. Vial is 2 ¼ in diameter x 2 ¾ in long. Set includes high purity 99.5% alumina ceramic grinding vial body, two slip-on alumina ceramic caps, one ½ in alumina ceramic ball, and eight corprene gaskets.

- Ideal for grinding hard, brittle samples to an analytical fineness
- Also useful for blending powders and mixing emulsions
- Long-wearing, very abrasion-resistant, and moderate efficiency
- Alumina components are 99.5% pure aluminum oxide
- Suitable for slurry grinding

Sample Capacity – Grinding: 2 - 8 g
Sample Capacity – Mixing: 20 mL
Hardness: Mohs 9; Knoop 2100
Major Elements: Al
Minor Elements: Si, Ca, Mg



220-95372-22

**8006
Methacrylate Grinding Vial Set**

55 mL methacrylate grinding vial set. Vial is 2 ½ in diameter x 2 5/8 in long. Heavy gauge methacrylate body with methacrylate-lined aluminum screw-on cap. Set includes one corprene gasket, two 1/2 in methacrylate balls, and four 3/8 in methacrylate balls.

- Ideal for pulverizing soft, brittle materials and for mixing liquids and powders
- Rugged construction allows grinding of soft materials without metallic contamination
- Suitable for slurry grinding

Sample Capacity – Grinding: 3 - 10 g
Sample Capacity – Mixing: 20 mL
Hardness: Mohs 1-1/2
Major Elements: C



220-95372-23

**8001
Hardened Steel Grinding Vial Set**

65 mL hardened steel grinding vial set. Vial is 2 ¼ in x 3 in long. Set includes a screw-on cap with O-ring, two ½ in and four ¼ in steel balls. Grinding vial body and cap liner are made of hardened tool steel. Grinding balls are made of type 52-100 steel.

- Ideal for grinding hard, brittle samples to an analytical fineness
- Also useful for blending powders and mixing emulsions.
- Moderate resistance to abrasion
- High durability and efficiency
- Suitable for slurry grinding

Sample Capacity – Grinding: 3 - 10 g
Sample Capacity – Mixing: 25 mL
Hardness: Mohs 5-1/2; Rockwell C 60-65
Major Elements: Fe
Minor Elements: Cr, Si, Mn, C



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